TANDY®

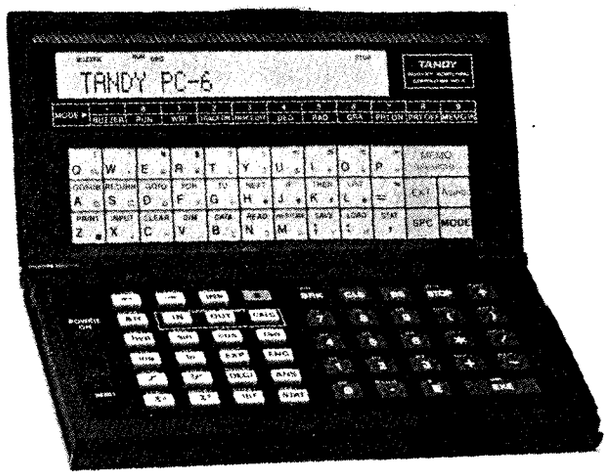
Service Manual

26-3672

POCKET SCIENTIFIC COMPUTER

PC-6

Catalog Number: 26-3672



CUSTOM MANUFACTURED FOR RADIO SHACK, A DIVISION OF TANDY CORPORATION

CONTENTS

PAGE

SPECIFICATIONS 3
- How To Open Upper Case 3

THEORY OF OPERATION 4
- Block Diagram 4
- LSI 5
- Ram Map 5
- Buzzer Control Circuit 6
- Interrupt Circuit 6
- Keyboard 6
- Power Supply 7

LSI (Pin Functions) 8

DISPLAY 9

TROUBLESHOOTING GUIDE 10
- Test Programs 11
- Operation Check 14

PCB ASSEMBLY VIEWS 19

PARTS LIST 20
- Electrical Parts 20
- Mechanical Parts 21

EXPLODED VIEW/DISASSEMBLY INSTRUCTIONS 23

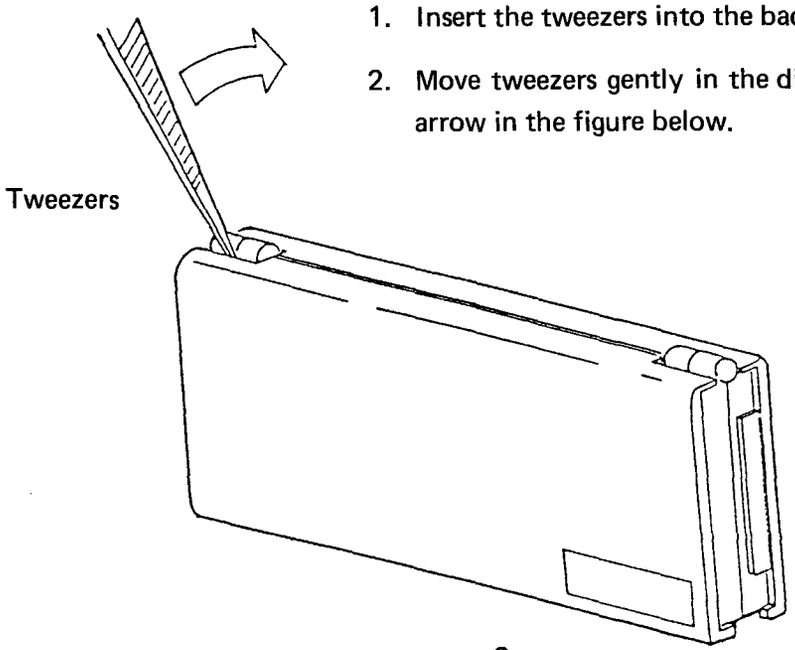
SCHEMATIC DIAGRAM 24
- Main Block 24
- Keyboard 25
- Display 26

SPECIFICATIONS

Display Method	5 x 7 dot-matrix crystal
Display	24-digit, dot-matrix liquid-crystal display
Calculation Range	$\pm 10^{-99} \sim \pm 9.999999999 \times 10^{99}$
Program System	Stored System
Program Language	BASIC
Number of Variables	26 fixed variables, exclusive character variable and array variables
RAM Capacity	7520 bytes (system area: 672 bytes)
Program Areas	Maximum of 10 (P0 through P9)
Number of Stacks	
Subroutine	8 levels
FOR ∿ NEXT LOOP	4 levels
Operators	12 levels
Power Supply	2 lithium batteries (CR-2032) for main frame 1 lithium battery (CR-1220) for memory backup
Power Consumption	Maximum 0.07W
Battery Life	1) Continuous program execution: approximately 85 hours 2) Continuous display of 5555555555 at 68° F (20° C): approximately 200 hours or 5.5 months when unit is used 1 hour per day NOTE: 1 hour includes 10 minutes of condition 1) and 50 minutes of condition 2)
Memory protection battery	Approximately 2 years (with main batteries installed)
Auto Power-off	Approximately 6 minutes
Ambient Temperature	32° F to 104° F (0° C to 40° C)
Dimensions	3/4"H x 5-5/8"W x 2-3/4"D (18 mm x 142 mm x 71 mm)
Weight	5.8 oz (165 g), including batteries

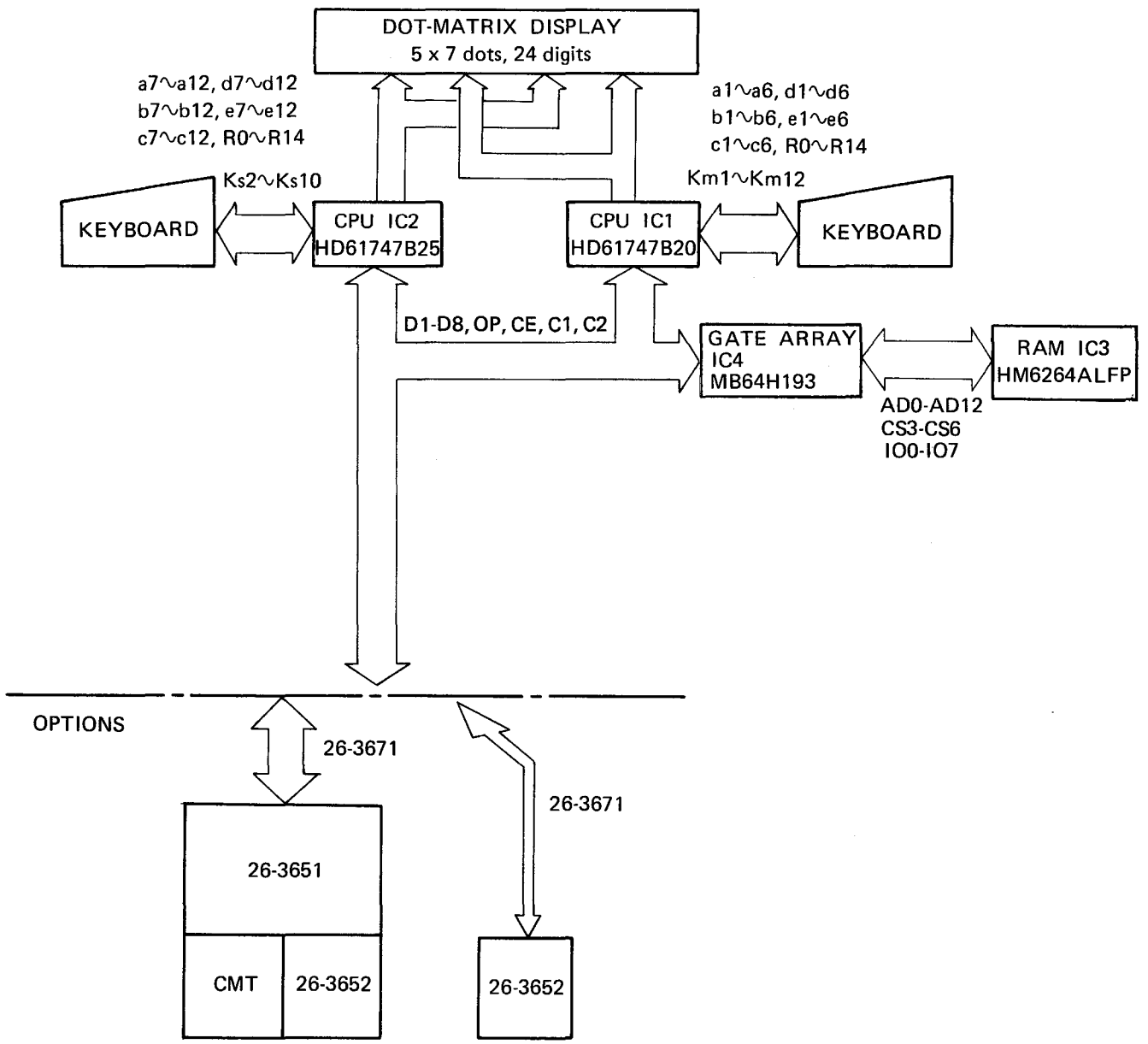
How To Open Upper Case

1. Insert the tweezers into the back of the upper case.
2. Move tweezers gently in the direction indicated by the arrow in the figure below.



THEORY OF OPERATION

Block Diagram



NOTE: Only one of 2 options can be connected at a time.

LSI

Main CPU

HD61747B20 — BASIC control, Key signal input/output (lower keyboard), 1st to 6th digits and 13th to 18th digits display control.

Sub CPU

HD61747B25 — Calculation, I/O control, key signal input/output (upper keyboard), 7th to 12th digits and 19th to 24th digits display control.

Gate Array

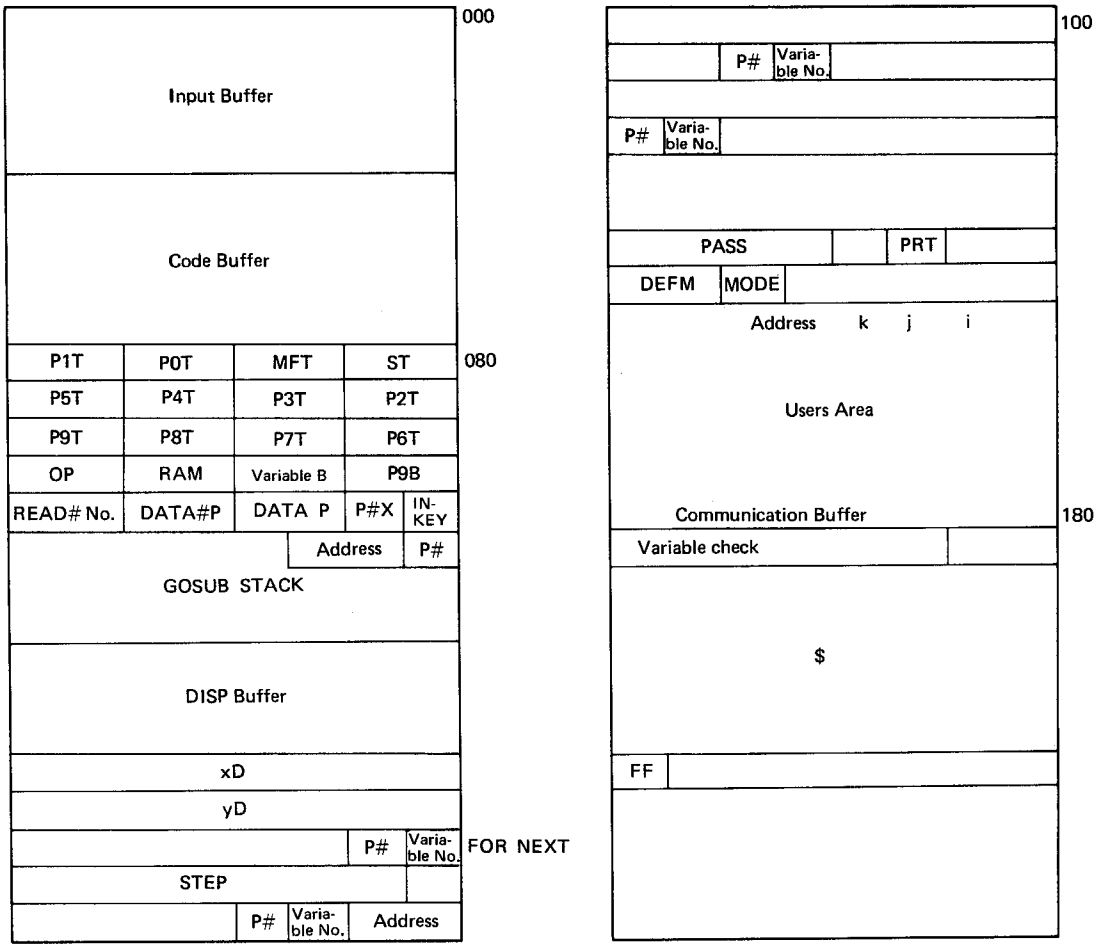
MB64H193 — Interface between CPU and RAM, buzzer control.

RAM

HM6264ALFP-50 — Stores data and program. RAM has 8K bytes (64K bits) capacity and contains a self-control circuit.

LSI	ROM	RAM
CPU (Main) HD61747B20	113024 bits	1896 bits
CPU (Sub) HD61747B25	113024 bits	1896 bits
RAM HM6264ALFP-50		65536 bits
TOTAL	226056 bits	69328 bits

Ram Map

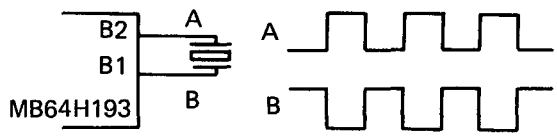


Buzzer Control Circuit

There are 3 ways to operate the buzzer:

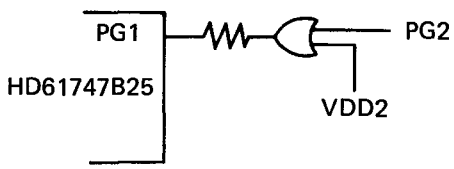
Key input, BEEP 0, and BEEP 1

Mode	BEEP 0	BEEP 1	Key Input
Frequency	0.9 kHz	4.55 kHz	4.55 kHz
Time	110 msec.	110 msec.	11 msec.

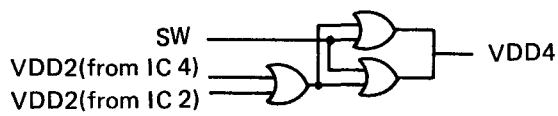


Interrupt Circuit

- Interrupt circuit for the clock pulse when VDD2 drops.
  1. When the power is on, VDD2 is "L" level.
  2. PG2 through the IC and 26th pin of the CPU receive PG2.
  3. When VDD2 drops, the output of the IC becomes "GND" level and the CPU does not receive PG2.

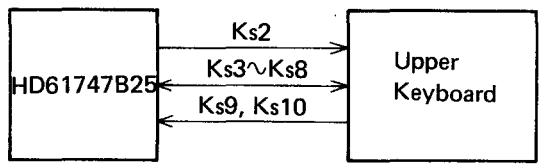


- Interrupt circuit for the voltage of the Gate Array and options when VDD2 and SW drop.
  1. When the power is on, VDD2 and SW is "L" level.
  2. VDD2 for Gate Array and VDD4 is also "L" level.
  3. When VDD2 drops, VDD2 for Gate Array and VDD4 becomes "GND" level and stops the oparation of the RAM and options.

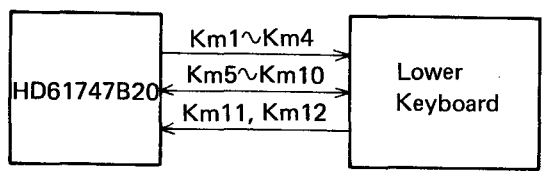


Keyboard

HD61747B25 controls the upper keyboard.



HD61747B20 controls the lower keyboard.



Power Supply

VSS1 Power supply voltage for TC4071BF.

VRAM Memory used to keep the voltage for the RAM.

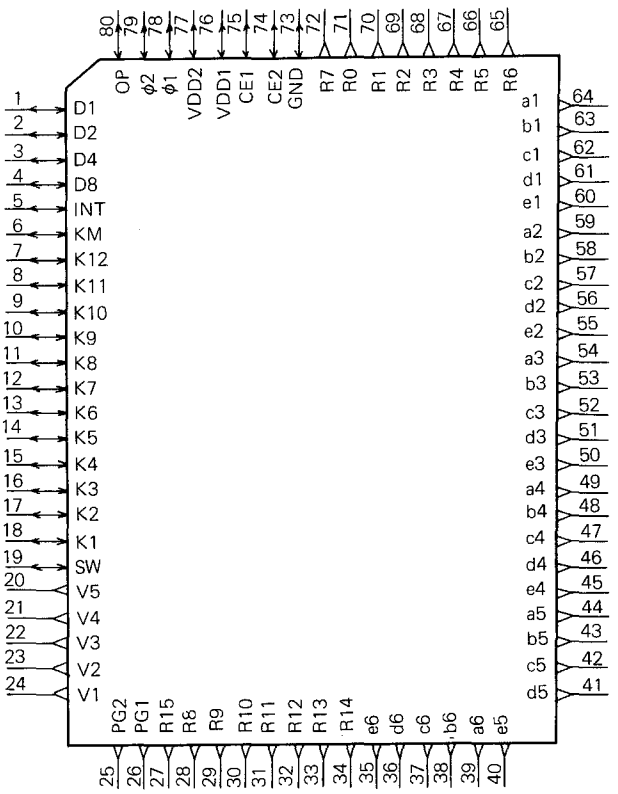
V1∼V5 LCD drive voltages. Voltage is generated by connecting the external resistor to VDD2.

VDD1 Power supply for the CPU, RAM and options.

VDD2 Stays VDD1 at power-on. Goes to GND at power-off or APO (auto power-off).

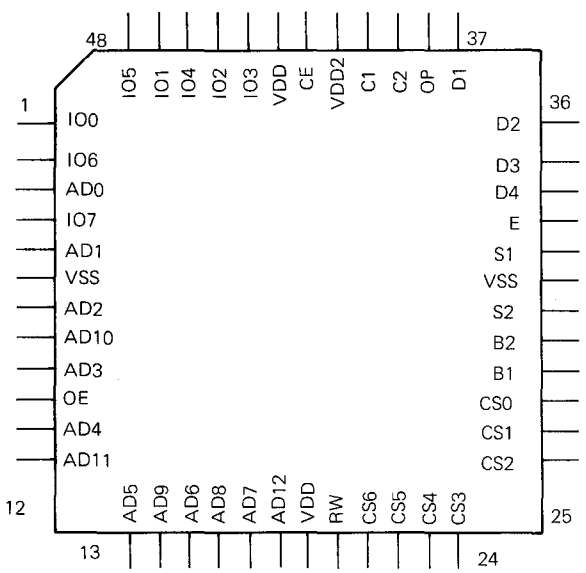
LSI (Pin Functions)

IC1, HD61747B20
IC2, HD61747B25



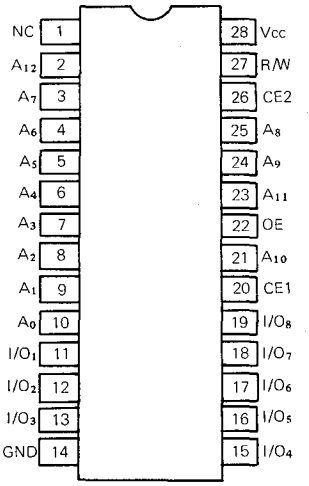
Pin No.	Signal Name	In/Out	Function
1∿4	D1, 2, 4, 8	In/Out	Data in/out (D1, D2, D3, D4)
5	INT	In	Interrupt signal from RAM
6∿18	KM∿K1	In/Out	Key signal for keyboard
19	SW	In/Out	Switch signal. GND at switch "OFF" and VDD1 at switch "ON".
20∿24	V5∿V1	Out	Display voltage. Divided voltage from VDD1.
25, 26	PG2, PG1	Out, In	CPU internal clock
27∿72	R15∿R7	Out	Display signal
73	GND	In	GND
74	CE2	In/Out	Chip designating signal. Select RAM or other devices
75	CE1	In/Out	Select RAM or other devices
76	VDD1	In	Power source
77	VDD2	Out	VDD1 output from the LSI. VDD1 at switch "ON" and GND switch "OFF".
78, 79	φ1, φ2	In/Out	Clock pulse
80	OP	In/Out	Operation signal

IC4, MB64H193



Pin No.	Signal Name	In/Out	Function
1, 2	IO0, IO6	In/Out	Data in/out
3	AD0	Out	Address signal
4	IO7	In/Out	Data in/out
5	AD1	Out	Address signal
6	VSS	In	Power source
7, 8, 9	AD2, 10, 3	Out	Address signal
10	OE	Out	Output enable
11∿18	AD4∿AD12	In/Out	Address signal
19	VDD	In	GND
20	RW	Out	Read/write signal
22∿24	CS6∿CS3	Out	Chip enable signal
25∿27	CS2∿CS0	–	NC
28, 29	B1, B2	Out	Buzzer signal
30	S2	In	GND
31	VSS	In	VSS
32	S1	In	GND
33	E	–	NC
34∿37	D4∿D1	In/Out	Data in/out
38	OP	In	Operation signal
39, 40	C2, C1	In	Clock pulse
41	VDD2	In	Power source
42	CE	In	Chip enable
43	VDD	In	GND
44∿48	IO3∿IO5	In/Out	Data in/out

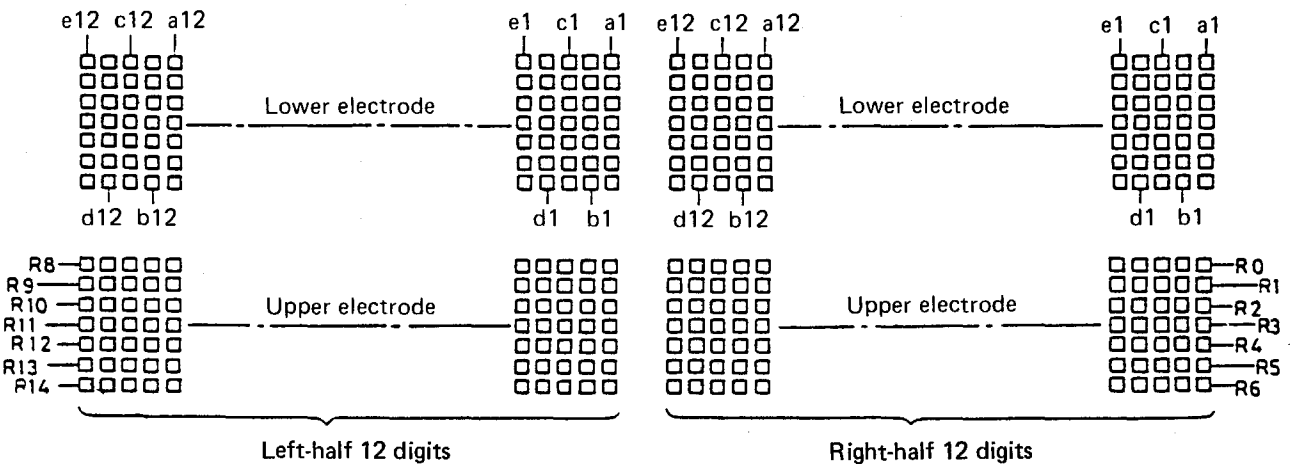
IC3, HM6264ALFB-50

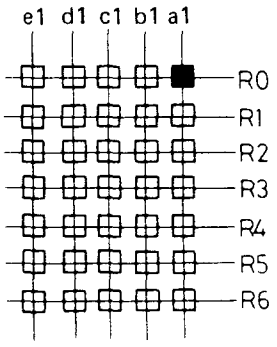


Pin No.	Signal Name	In/Out	Function
1	NC	–	NC
2∿10	A12∿A0	In	Address signal
11∿13	I/O1∿I/O3	In/Out	Data signal
14	GND	In	VSS terminal
15∿19	I/O4∿I/O8	In/Out	Data signal
20	CE1	In	Chip enable
21	A10	In/Out	Address signal
22	OE	Out	Output enable
23∿25	A11, 9, 8	In/Out	Address signal
26	CE2	In	GND
27	R/W	In	Read/write signal
28	VDD	In	GND

DISPLAY

Numbers and characters are displayed in 5 x 7 dots.
Following is an explanation of a dot-matrix LCD.





On the upper electrode of the LCD, common signals R0∿R6 and R8∿R14 are applied horizontally while other signals a1∿e1 to a12∿e12 are applied vertically on the lower electrodes as shown in above figures.
In the left figure, the upper-right corner of the dot is displayed when a voltage difference exists between signals R0 and a1. The CPU outputs the display signals to the LCD display.
CPU HD61747B20 controls the 1st to 6th and 13th to 18th digits of display, while HD61747B25 controls the 7th to 12th and 19th to 24th digits.

TROUBLESHOOTING GUIDE

Symptom	Cause	Solution
No display at all.	Weak batteris	Replace the batteries.
	Poor battery contact	Clean the battery and contact spring. Lift the battery spring.
	Peeled heat seal	Replace the heat seal.
	Broken heat seal	Replace the heat seal.
	LCD (CA51-TS)	Replace the LCD.
	LSI (HD61747B)	Replace the LSI.
A certain segment(s) cannot be displayed.	Peeled heat seal	Replace the heat seal.
	Broken heat seal	Replace the heat seal.
	LCD (CA51-TS)	Replace the LCD.
	LSI (HD61747B)	Replace the LSI.
Calculation impossible.	LSI (HD61747B)	Replace the LSI.
A certain button does not function.	Poor key contact	Celan the contact pad on the PCB and the key contact rubber.
	Broken PC line	Connect the PC line.
	Peeled heat seal	Replace the heat seal.
	LSI (HD61747B)	Replace the LSI.

Test Program

Notes:

1. After typing in the programs below, save the programs to a cassette tape for future use.
2. Memory and printer check programs cannot be executed at the same time because of a limited memory capacity.

Memory check program

```
Ready PØ
LIST
  1Ø CLEAR
  2Ø C=9Ø4
  25 DEFM C
  3Ø FOR B=1 TO C
  4Ø D(B)=B
  5Ø NEXT B
  6Ø $="ABCDEFGHIJKL
     MNOPQRSTUVWXYZ"
  7Ø BEEP 1: BEEP 1
  8Ø PRINT "INPUT OK
     *";
  9Ø GOTO #1
```

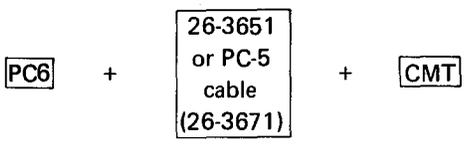
```
Ready P1
LIST
   5 A=Ø
   7 A=A+1
  1Ø FOR B=1 TO C
  2Ø IF D(B)≠B THEN
     1ØØ
  3Ø NEXT B
  4Ø IF $="ABCDEFGHI
     JKLMNOPQRSTUVWX
     YZ" THEN 1ØØ
  5Ø IF A=5 THEN 11Ø
  6Ø PRINT A;: GOTO
     7
 1ØØ PRINT "CHECK**N
     G**";: BEEP 1:
     BEEP Ø: GOTO 111
 1Ø1 PRINT "A=";A;
 11Ø PRINT "CHECK**O
     K**";: BEEP 1:
     BEEP 1
 111 PRINT "A=";A;:
     END
```

Printer check program

```
Ready P1
LIST
  1Ø MODE 7
  2Ø PRINT "   **PC-
     6 CHECK**   ";
  3Ø PRINT "ABCDEFGH
     IJKLMNOPQRSTUVW
     XYZ";
  4Ø PRINT "abcdefgh
     ijklmnopqrstuvw
     xyz";
  5Ø PRINT "Ø.123456
     789";
  6Ø PRINT "%'@¥[]&←
     ↓→○□▲X ÷ ♠♥♦♣⁞▮ •°
     -ΣΩμγδ";
  7Ø PRINT "!#$?\<≤≥
     >≠↑()*/+-επ";
  8Ø FOR A=1 TO 28
  9Ø PRINT "8";
 1ØØ NEXT A
 11Ø PRINT "     -
     END-     "
 12Ø MODE 8
```

Program SAVE, LOAD and MEMORY

System:



Operation:

(1) PW SW ON

(2) CMT PLAY MODE

(3) [S] [LOAD :] [EXE] LOAD

END

BUZZER RUN DEG
Ready PØ

(4) PW SW OFF — Take out the 26-3651 + CMT

(5) PW SW ON

BUZZER RUN DEG
Ready PØ

(6) [S] [Ø]

BUZZER RUN DEG DEFM
INPUT OK* (Buzzer sound)

BUZZER RUN DEG DEFM
INPUT OK*1

BUZZER RUN DEG DEFM
INPUT OK* 1 2
BUZZER RUN DEG DEFM
INPUT OK* 1 2 3

BUZZER RUN DEG DEFM
INPUT OK* 1 2 3 4

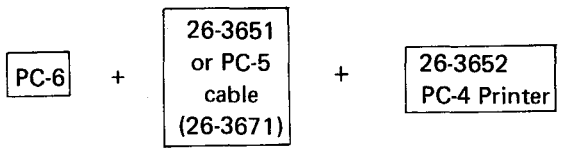
BUZZER RUN DEG DEFM
INPUT OK* 1 2 3 4CHECK**OK**A=5 (Buzzer sound) OK

BUZZER RUN DEG DEFM
INPUT OK* CHECK**NG**A=1 (Buzzer sound) NG

(7) [BRK]

Printer check

System:



(1) PC-6 PW SW ON.

(2) S 2 READY PØ

Print sample:

```
   **PC-6 CHECK**
ABCDEFGHIJKLMNOPQRST
UVWXYZabcdefghijklmn
opqrstuvwxyzØ.123456
789%'@¥[]&←↓→○□▲X÷♠♥
♦♣⁞▮•° ΣΩμγδ!#$?\<≤≥
>≒†()*/+-επ88888888
8888888888888888888
        -END-
```

Operation Check

1. When mis-operation occurs, return to the nearest ★ mark and operate from the ★ mark.
2. When connecting the printer and cassette interface, be sure to turn off the power switch.

Operation	Read Out
[RESET]	BUZZER RUN DEG Ready PØ
★[MODE] 1	BUZZER WRT DEG 752Ø P-Ø-123456789
★[MODE] Ø	BUZZER RUN DEG Ready PØ
QWERTYUIOP	BUZZER RUN DEG QWERTYUIOP
★[BRK] ASDFGHJKL = [EXT]	BUZZER EXT RUN DEG ASDFGHJKL =
★[BRK] ZXCVBNM; : , [SPC]	BUZZER EXT RUN DEG zxcvbnm; :
[S] ←	BUZZER EXT RUN DEG -z- xcvbnm; : ,
[S] →	BUZZER EXT RUN DEG zxcvbnm; : ,
[CLS]	BUZZER EXT RUN DEG

Operation	Read Out
★ BRK Ø.123+456−789★9/3 EXE	BUZZER EXT RUN DEG −1910.877
★ BRK E( )↑ BS ← ← → →	BUZZER EXT RUN DEG (Check that the cursor moves.) E( )↑ E( )
★ BRK &H hyp sin cos tan log in EXP √ ∛ DEG(ANS x^2 x^3 10^x	BUZZER EXT RUN DEG UR DEG (−1910.877 ↑ 2 ↑ 310↑ ■
★ BRK 1.2 STAT	BUZZER EXT RUN DEG STAT 1.2 , Ø
★ BRK S sin 1 EXE	BUZZER EXT RUN DEG 90
ENG	BUZZER EXT RUN DEG 90 E ØØ
★ BRK EXT A = B ★ C IN	BUZZER RUN DEG

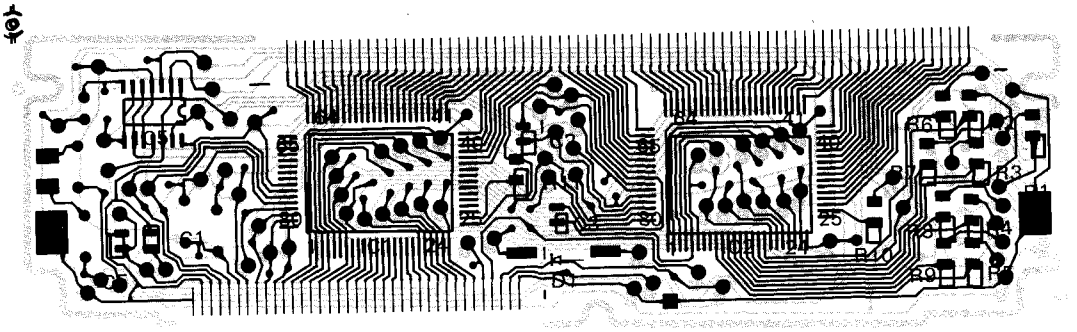
Operation	Read Out
[CALC]	BUZZER RUN DEG B ?
123 [EXE]	BUZZER RUN DEG C ?
456 [EXE]	BUZZER RUN DEG STOP A = 56Ø88
[OUT]	BUZZER RUN DEG STOP A = B ★ C
★ [MODE] Ø	BUZZER RUN DEG Ready PØ
★ [MODE] •	RUN DEG Ready PØ
★ [MODE] • [MODE] 2	BUZZER RUN DEG TRACEON Ready PØ
★ [MODE] 3 [MODE] 5	BUZZER RUN RAD Ready PØ
★ [MODE] 6	BUZZER RUN GRA Ready PØ

Operation	Read Out
★[MODE] 7	BUZZER RUN GRA PRT ON Ready PØ
★[MODE] 8 [MODE] 9	BUZZER GRA [MEMO][IN] 1
Q W [EXE] ◀ ◀	BUZZER GRA [MEMO][IN/EDIT] 1 Q-W-
[INS]	BUZZER GRA [MEMO][IN/EDIT] 1 Q W
E [S] [INS]	BUZZER GRA [MEMO][IN/EDIT] 1 QE
[EXE]	BUZZER GRA [MEMO][IN] 1 QE
[MEMO]	BUZZER GRA [MEMO][IN] 2
[Asmbl]	BUZZER [ASMBL] Asmbl/Source/ca1
★[BRK]	BUZZER RUN GRA Ready PØ

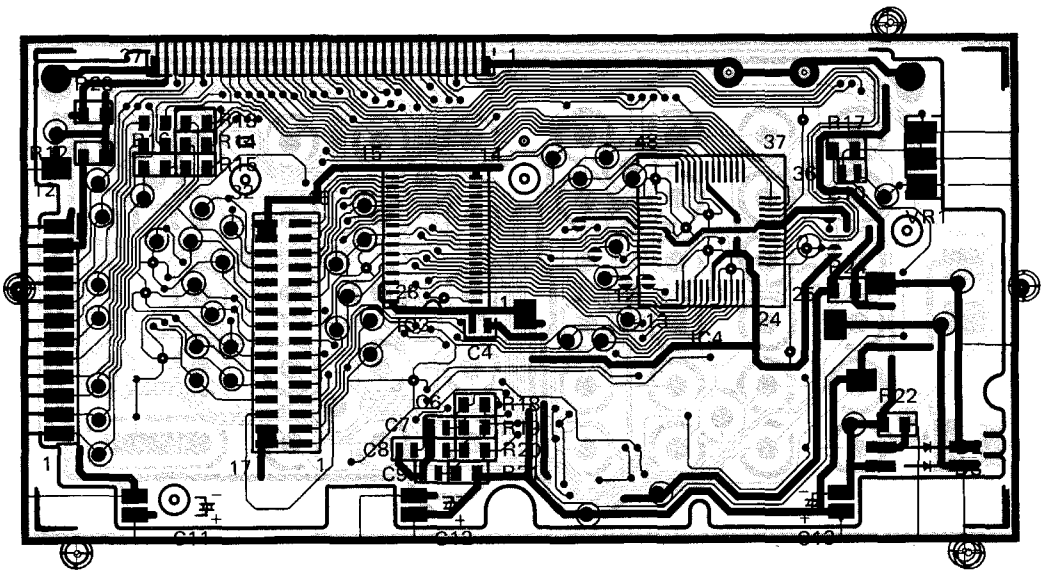
Operation	Read Out
[MODE] 9 [MEMO] [BS] [BS] [EXE] [MODE] Ø	BUZZER RUN GRA Ready PØ
★[MODE] 1 1Ø BEEP 1 [EXE]	BUZZER WRT GRA 7515 1Ø BEEP 1
2Ø [S] D 1Ø [EXE]	BUZZER WRT GRA 75Ø9 2Ø GOTO 1Ø
★[MODE] Ø [S] Ø	BUZZER RUN GRA (buzzer sound)
[STOP]	BUZZER RUN GRA STOP
POWER SW OFF/ON Repeat 3 times. Turn the contrast volume.	Display must disappear. Display should be "Ready PØ." The display contrast must change.

PCB ASSEMBLY VIEW

TOP VIEW



TOP VIEW



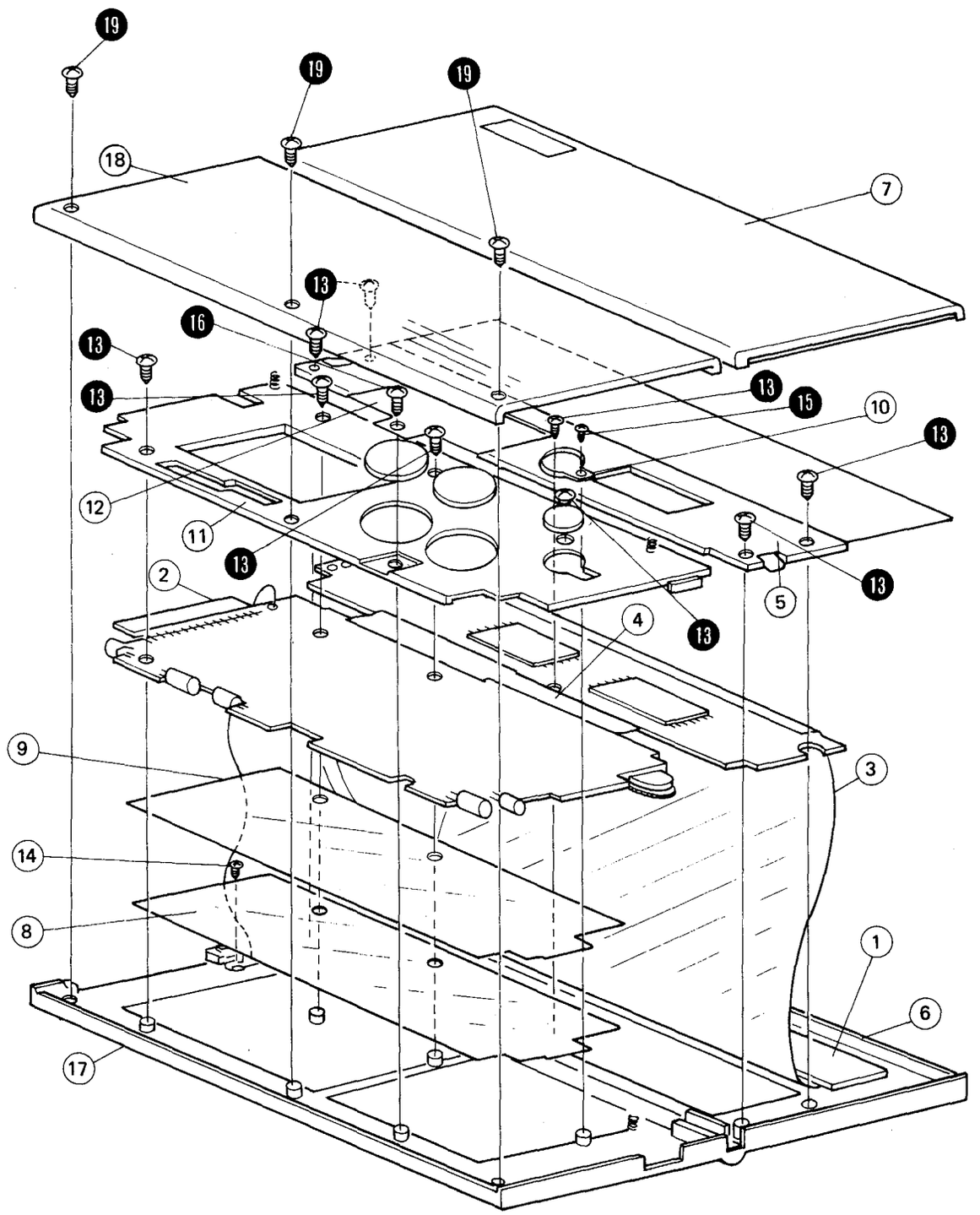
PARTS LIST

Electrical Parts			
Ref. No.	Description	RS Part No.	Mfr's Part No.
CAPACITORS			
C1∿C4	Chip, Ceramic, 100pF, 25V, ±5%, CM21CH101J25V	ACF-1466	28907311
C5∿C10	Chip, Ceramic, 0.1μF, 15V, +100%, CM21YV104P15V	ACF-7347	71032167
C11, C12	Electrolytic, 22μF, 10V, ±20%, CE04C-1A220MS7	CE-226MCBA	28047223
C13	Electrolytic, 100μF, 10V, ±20%, CE04C-1A101MS	CE-107MCBA	28041047
ICs			
IC1	LSI, CPU, HD61747B20	MX-7273	20018364
IC2	LSI, CPU, HD61747B25	MX-7274	20018801
IC3	LSI, RAM, HM6264ALFP-50	MX-7275	20011149
IC4	LSI, MB64H193	MX-7276	20030453
IC5	IC, TC4071BF	MX-4245	21004359
PRINTED CIRCUIT BOARD ASSEMBLIES			
PC1	Assembly, PCB-G707-1		82636701
PC2	Assembly, PCB-G707-2		82636702
RESISTORS			
R1∿R9	Chip, Ruthenium, 3.3 Kohm, 1/8W, ±5%, CR32-108-332J-T-TP	ND-0230EBN	27930620
R10	Chip, Ruthenium, 12 Kohm, 1/8W, ±5%, CR32-108-123J-T-TP	ND-0288EBN	27930638
R11	Chip, Ruthenium, 68 Kohm, 1/8W, ±2%, CR32-108-683G-T-TP	ND-0354CBN	27904530
R12	Chip, Ruthenium, 220 ohm, 1/8W, ±10%, CR32-108-221K-T-TP	ND-0149FBN	27904734
R13∿R16	Chip, Ruthenium, 3.9 Kohm, 1/8W, ±5%, CR32-108-392J-T-TP	ND-0237EBN	27903835
R17∿R21	Chip, Ruthenium, 10 Kohm, 1/8W, ±2%, CR32-108-103G-T-TP	ND-0281CBN	27930603
R22	Chip, Ruthenium, 22 Kohm, 1/8W, ±5%, CR32-108-223J-T-TP	ND-0311EBN	27903740
R23	Chip, Ruthenium, 2.2 Mohm, 1/8W, ±5%, CR32-108-225J-T-TP	ND-0454EBN	27904761
R24	Chip, Ruthenium, 100 ohm, 1/8W, ±10%, CR32-108-101K-T-TP	ND-0132FBN	27904629
MISCELLANEOUS			
D1∿D3	Diode, 1S1588, silicon	DX-0273	23003031
VR1	Volume, for contrast, 20 Kohm, EVL-AHAA00B24	AP-7004	27709486

Mechanical Parts			
Ref. No.	Description	RS Part No.	Mfr's Part No.
1	LCD, CA51-TS	AL-1020	33310552
2	Connector, 126D-019-12S04	AJ-7306	35113639
	P spring, A33138A-1	ARB-7642	63258131
3	Seal, Heat, T-07-12	AHC-0107	56005846
	Seal, Insulation, for heat seal, A47070-8	AHC-0344	63416110
	Plate, Reinforcement, for LCD, C46480-1		63478850
	Tape, Adhesive, for LCD, A43613-5		63415920
	Tape, Adhesive, for LCD reinforcement plate, A45344-8		63375130
	Connector, Non-direction, A46359-1	AJ-4025	63354990
	Sheet, Keyboard, C3473-5	AHC-0346	82636721
	Tape, Adhesive, for PCB reinforcement plate		63424150
	Plate, Reinforcement, for PCB-G707-1, C3474A-1	AHC-0345	63415991
	Assembly, Film, keyboard, C3769A-1	AK-0518	63471021
	Film, Keyboard, C3768-1	AHC-0347	63471030
	Cushion, for LCD, C41409-1		63505660
4	Seal, Heat, PCB-G707-1 to PCB-G707-2, CAX-12-3	AHC-0348	56006320
	Seal, Insulation, for heat seal of PCB	AHC-0349	63471010
	Seal, Insulation, for upper keyboard film	AHC-0350	63470990
	Seal, Insulation, for lower keyboard film	AHC-0351	63471000
	Plate, Shield, for volume	ART-0278	63458880
	Seal, Blind, for P spring, C41076-1		63471050
	Seal, Insulation, for battery (non-repairable)		
	Seal, Insulation, for RAM pack (non-repairable)		
	Buzzer, EFB-S55C41AV1	AB-7002	32401627
	Tape, Adhesive, for buzzer, A45381-1		63304750
	Tape, Adhesive, for keyboard sheet, A44646-1		63275120
5	Holder, for PCB-G707-1, C2373-1		63470730
	Plate, Shield, C3500-1		63415930
	Window (Tandy)		82637403
	Tape, Adhesive, for window, C4586A-1		63415891
6	Case, Upper, for display unit, C1141-5	AZ-0109	63470460
7	Case, Lower, for display unit (Tandy), C1142-1		82636704
	Plate, Name (Tandy) (non-repairable)		
	Knob, Slide, C3499A-1		63416351
	Spring, Switch contact, A46683-1	RB-6256	63353610
8	Film, Common, C3480-1	AHC-0111	63415950
9	Spacer, C3479-1	AHC-0352	63415960
	Set, Keytop (Tandy)	AHC-0353	82636705

Ref. No.	Description	RS Part No.	Mfr's Part No.
10	Holder, Battery, for CR1220, A35803-1	AB-0623	63349650
	Spring, Battery contact (–), for CR1220, A35801-1	AB-0621	63349890
	Spring, Battery contact (+), CR1220, A35800-1	AB-0622	63349900
	Seal, Insulation, for battery (CR1220), A46472-1	AHC-0354	63349910
11	Holder, for PCB-G707-2, C1251-1		63470550
12	Holder, Battery, for CR2032, A35802-1	B-0058	63349640
	Spring, Battery contact (–), for CR2032	ARB-7639	63297621
	Spring, Battery contact (+, –), for CR2032	ARB-7640	63297630
	Spring, Battery contact (+), for CR2032	ARB-7641	63297640
	Seal, Insulation, for battery (CR-2032), A45154-1	AHC-2114	63297660
	Seal, Insulation, for battery holder, A46473-1	AB-0624	63349720
	Plate, Shield, for connector, C4609-1	ART-0279	63415940
	Cap, Connector, C4615-1	AHC-0112	63416410
	Pin, Spring, 2.5 mm x 12 mm	ART-0280	52100356
	Label, Change for battery, (non-repairable)		
	Tape, Lead, C4957-1		63459150
	Seal, Blind, for PCB holder, C4991-1	AHC-0355	63470840
	Spacer, for lead tape, C41003-1	AHC-0354	63449540
	Tape, Adhesive, for volume shield plate, A45344-14		63393830
	Plate, Reinforcement, for PCB holder, PCB-G707-2		63500830
	Plate, Reinforcement, for PCB holder, PCB-G707-1		63500840
	Tape, Adhesive, for PCB-G707-1 reinforcement		63497930
	Tape, Adhesive, for PCB-G707-2 reinforcement		63500850
	Seal, Insulation, for volume shield plate, C4639-1		63417130
	Spring, Ground, for keyboard case, A47157-7	ARB-5025	63416020
	Spring, Ground, for keyboard film, C4988-1	ARB-5045	63470830
	Spring, Ground, for PCB holder, C4737-1	ARB-5046	63424160
13	Screw, Tapping, flat head (+), 2 mm x 3.5 mm A45491-13, for PCB holder	AHD-2723	63330000
14	Screw, Tapping, flat head, (+), 2 mm x 3 mm A45491-11, for connector shield plate	AHD-3002	63319760
15	Screw, Tapping, flat head (+), 2 mm x 5 mm A44793-13, for battery (CR-1220)	AHD-3003	63292930
16	Screw, Machine, pan head, (+), 1.7 mm x 5 mm A45919-7, for battery (CR-2032)	AHD-2012	63391680
17	Case, Upper, for keyboard unit (Tandy)	AZ-0110	63470445
18	Case, Lower, for keyboard unit (Tandy)		82636723
19	Hardware Kit	AHW-2603672	82636709
	Screw, Machine, pan head, (+), 1.7 mm x 5.4 mm x 3 pieces A45919-8	AHD-2013	63426830
	Battery, Lighium, CR2032	ACS-0031	CR2032
	Battery, Lighium, (for Memory back up) CR1220	ACS-0030	CR1220

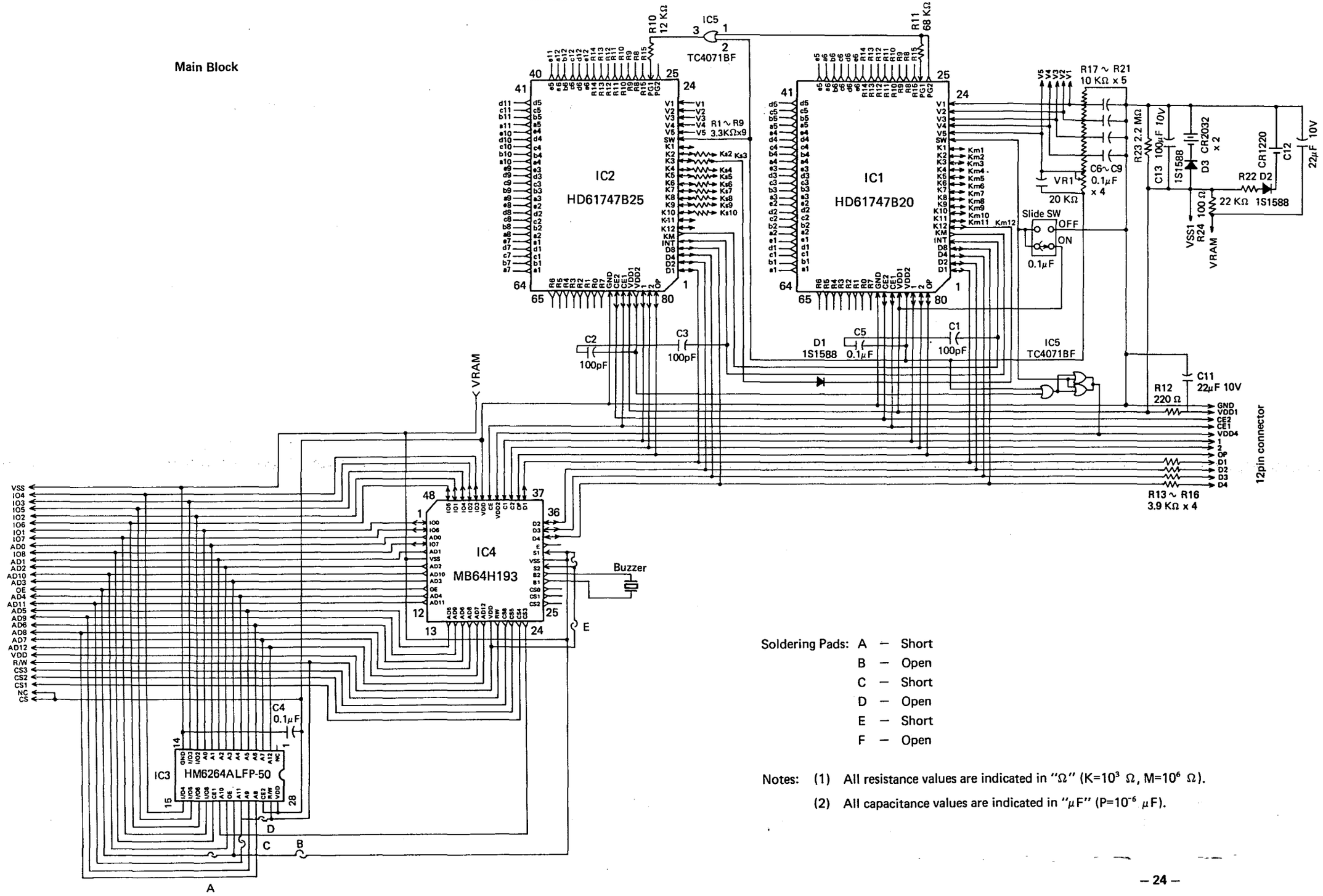
EXPLODED VIEW/DISASSEMBLY INSTRUCTIONS



1. Remove 3 screws (19) from the lower case.
2. Lift up the lower case (18) and (7).
3. Remove 9 screws (13), 1 screw (15) and 1 screw (16) from the PCB holder (11) and (5).
4. Remove the PCB holder and 2 batteries.

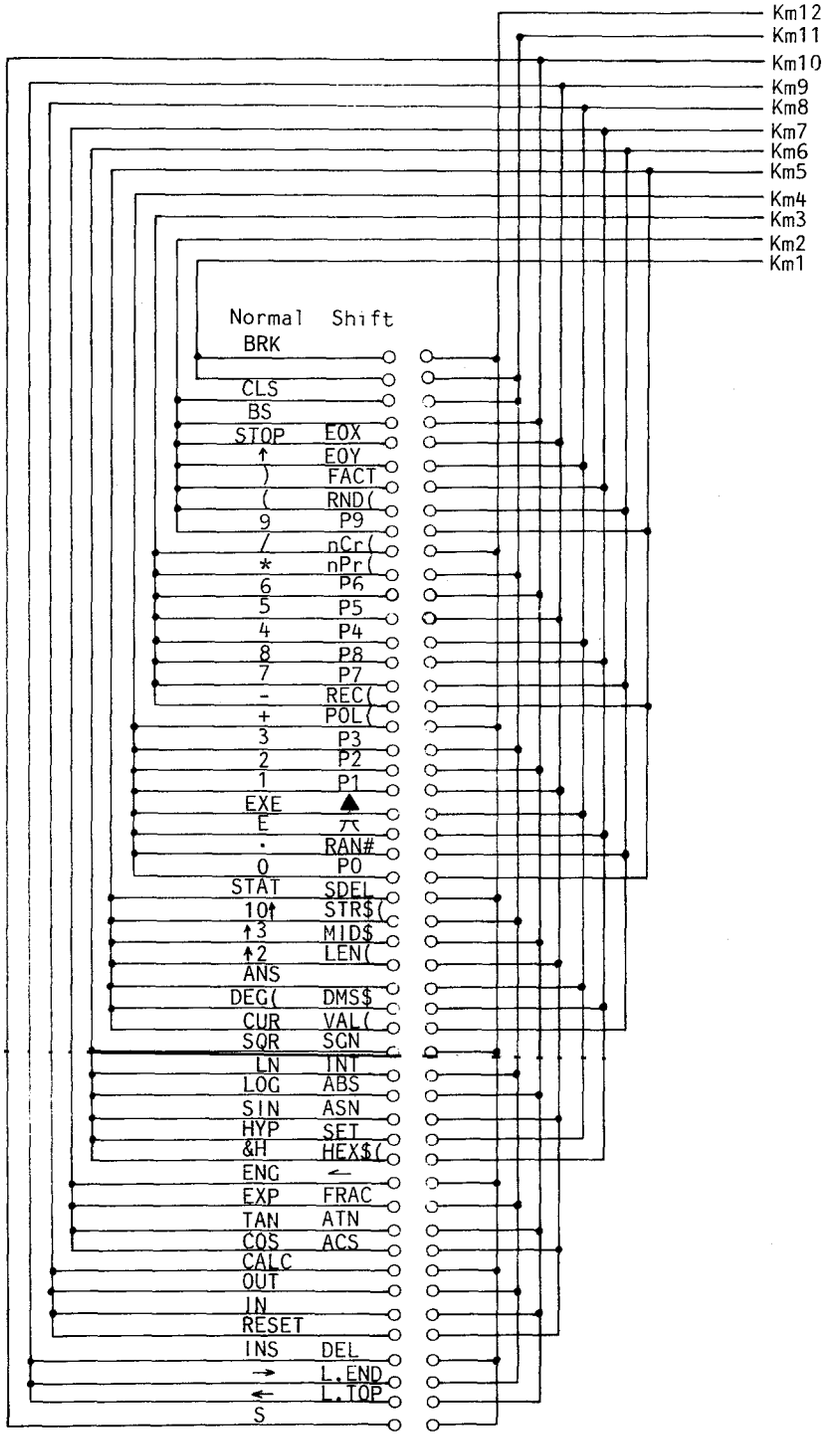
SCHEMATIC DIAGRAM

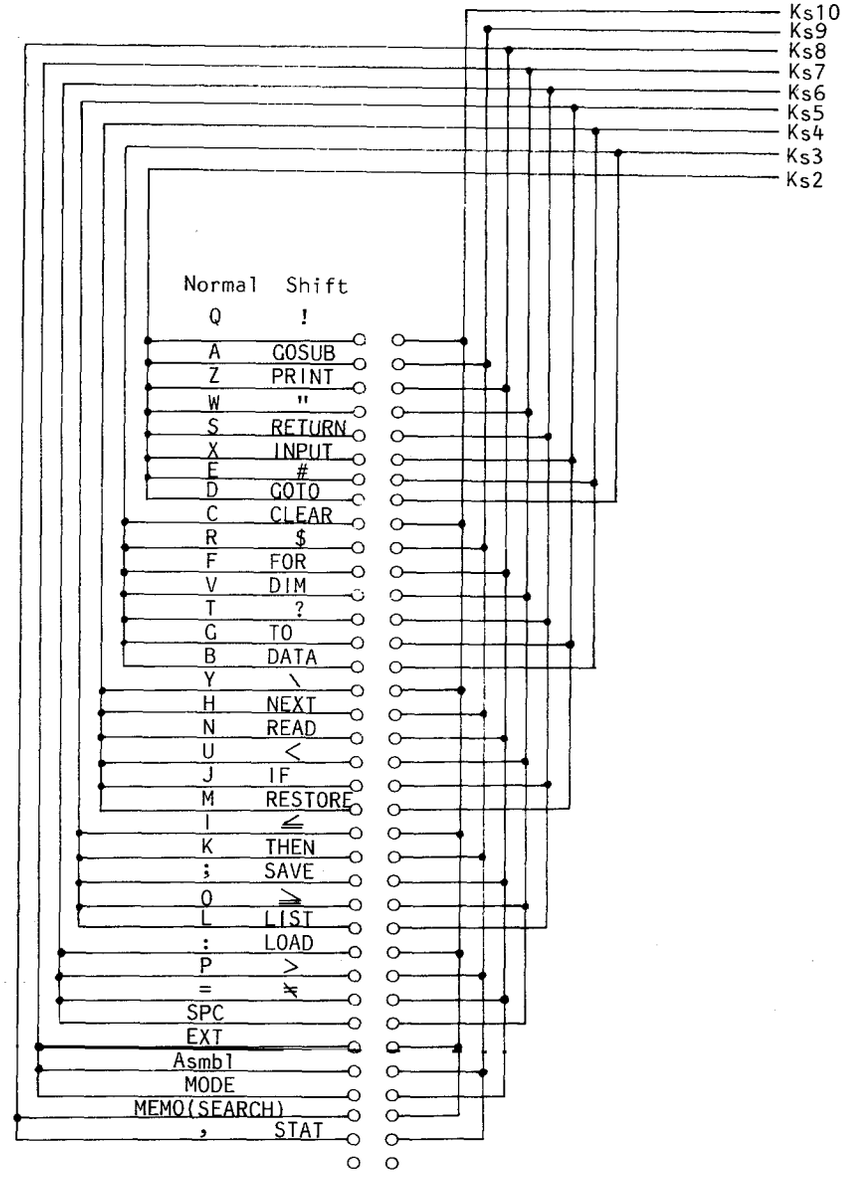
Main Block

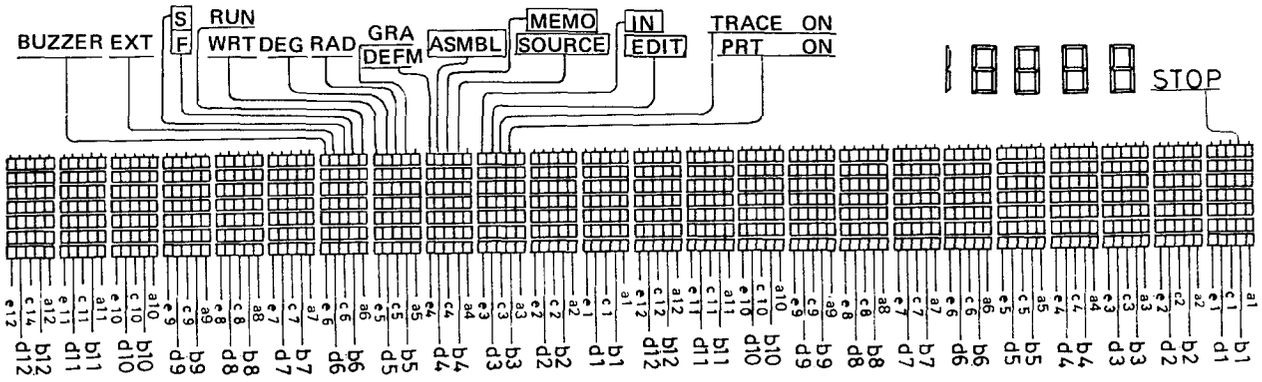


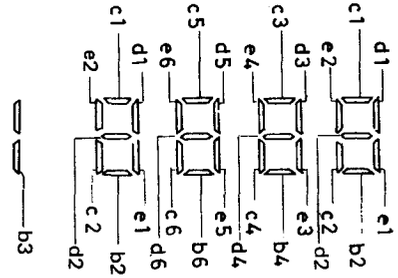
Soldering Pads: A – Short
B – Open
C – Short
D – Open
E – Short
F – Open

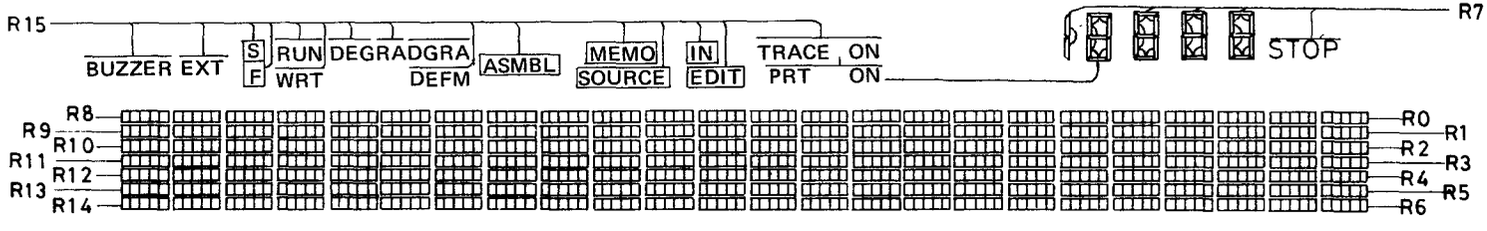
Notes: (1) All resistance values are indicated in "Ω" (K=10^3 Ω, M=10^6 Ω).
(2) All capacitance values are indicated in "μF" (P=10^{-6} μF).


Km12
Km11
Km10
Km9
Km8
Km7
Km6
Km5
Km4
Km3
Km2
Km1
Normal Shift
BRK
CLS
BS
STOP EOX
↑ EOY
) FACT
(RND(
9 P9
/ nCr(
* nPr(
6 P6
5 P5
4 P4
8 P8
7 P7
- REC(
+ POL(
3 P3
2 P2
1 P1
EXE
E
. RAN#
0 P0
STAT SDEL
10↑ STR$(
↑3 MID$
↑2 LEN(
ANS
DEG(DMS$
CUR VAL(
SQR SGN
LN INT
LOG ABS
SIN ASN
HYP SET
&H HEX$(
ENG
EXP FRAC
TAN ATN
COS ACS
CALC
OUT
IN
RESET
INS DEL
→ L.END
← L.TOP
S


Ks10
Ks9
Ks8
Ks7
Ks6
Ks5
Ks4
Ks3
Ks2
Normal Shift
Q !
A GOSUB
Z PRINT
W "
S RETURN
X INPUT
E #
D GOTO
C CLEAR
R $
F FOR
V DIM
T ?
G TO
B DATA
Y \
H NEXT
N READ
U <
J IF
M RESTORE
I ≦
K THEN
; SAVE
O ≧
L LIST
: LOAD
P >
= ≠
SPC
EXT
Asmbl
MODE
MEMO(SEARCH)
, STAT


BUZZER EXT
S
F
RUN
WRT
DEG
RAD
GRA
DEFM
ASMBL
MEMO
SOURCE
IN
EDIT
TRACE ON
PRT ON
STOP




R15
BUZZER EXT
S
F
RUN
WRT
DEG
RAD
GRA
DEFM
ASMBL
MEMO
SOURCE
IN
EDIT
TRACE ON
PRT ON
R7
STOP
R8
R9
R10
R11
R12
R13
R14
R0
R1
R2
R3
R4
R5
R6

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